54. **[NEW]** The kit of Claim 52, wherein the microorganism is selected from the group consisting of *Acinetobacter calcoaceticus*, *Agrobacter tumefaciens*, and *Ruminococcus albus*.

55. **[NEW]** The kit of Claim 52, wherein the microorganism contains an antigenic peptide comprising an amino acid sequence as shown in SEQ. ID. NOS: 1, 3, 4, and 5.

REMARKS

Claims 1-12 have been cancelled herein. Such cancellation is without prejudice on the merits to further prosecution of these claims in one or more continuation applications. Claims 13-55 have been added herein. These claims enjoy explicit support in Claims 1-12 as originally filed and throughout the specification. In particular, the language in independent Claims 13, 28, and 40, regarding the sequence homology of the antigenic peptide in the microorganism, enjoys verbatim support in the specification at page 2, in the paragraph following the table.

Regarding independent Claim 40 and the claims dependent thereon (drawn to a method of diagnosing multiple sclerosis in humans), Applicant directs the Examiner's attention to page 6 of the application as filed, last paragraph. Here, it is noted that the method described therein is extendible to methods of diagnosing multiple sclerosis. As discussed in full below, the work that was in progress when the subject application was filed has now been completed. This work, submitted herein in the form of a Rule 132 Declaration of inventor Alan Ebringer (work that has since been published in a peer-reviewed journal article), clearly shows that the method works to diagnose multiple sclerosis in human subjects.

The specification has been amended to insert sequence identification numbers where appropriate. A substitute sequence listing is attached hereto (in both paper and computer-readible format). Applicant requests entry of the substitute sequence listing in place of the sequence list previously submitted. The sequence identification numbers in the substitute sequence list correspond to those inserted into the specification by this

amendment. The paper copy and CRF version of the sequence list are identical to each other and do not add any new matter to the application.

The following remarks address the issued presented in the Office Action in the order of their appearance:

Drawing Figure:

Applicant acknowledges that the application was filed with an informal drawing figure. A formal drawing figure will be submitted upon an indication of allowable subject matter.

The specification has been amended to insert a brief description of the sole drawing.

Objection to Claim 6:

This objection has been rendered moot by cancellation of the claim.

Rejection of Claims 1-12 Under 35 USC §112, First Paragraph:

This rejection has been obviated, in part, by cancellation of Claims 1-12, and is, in part, respectfully traversed.

The claims submitted herein are drawn to a method of diagnosing "spongiform encephalopathy" and "multiple sclerosis" in mammals, including humans and bovines. Insofar as the Office has already acknowledged that the specification is enabling for claims directed to the diagnosis of "spongiform encephalopathy in cattle," this rejection is not applicable to Claims 15 and 28-39. These claims are limited to the diagnosis of spongiform encephalopathy in bovines. Because the Office has admitted that the specification is enabling for such a method, as applied to Claims 15 and 28-39, this rejection is improper.

This rejection also is not applicable to Claims 52-55 because these claims are drawn to a kit, not a method. The Office has not articulated any rationale for rejecting the kits claims based on a lack of enablement. Fabricating the kits, of course, is very straightforward. Applicant therefore submits that the kits as claimed are clearly enabled by the specification.

As applied to Claims 13, 14, 16-27, and 40-51, this rejection is believed to have been obviated in part. The phrase "other demyelinating conditions" has been removed from the claims, thus rendering this aspect of the rejection moot.

Regarding the diagnosis of spongiform encephalopathy and multiple sclerosis in mammals other than bovines, Applicant respectfully traverses this rejection because the specification contains ample information on how to practice the method on any other type of mammal, including humans. The test is applied to any mammal in the exact same fashion as disclosed in the specification for cattle. Specifically, sera are taken from a collection of known "normal" or "non-spongiform encephalopathy" subjects, and the sera are subjected to the ELISA described in the specification at pages 4 and 5. A graph like the sole drawing figure included in the specification is then constructed, with the ELISA results from the "normal" subjects indicating the range of antibodies that can be considered "normal." Subjects suspected of having spongiform encephalopathy are then tested in the exact same fashion. The ELISA results are plotted onto the same graph. If the ELISA results indicate increased levels of the antibody being assayed, the subject is positively identified as having spongiform encephalopathy.

In short, the method of testing is essentially the same for use in human diagnosis as for use in cattle to diagnose BSE. The test kit for use in these tests will contain essentially identical reagents or corresponding reagents for the respective human and animal tests. The specific example of an ELISA test, presented in the specification at pages 4 and 5 is noted as being an illustrative example, and the ELISA method protocol presented at page 5 is described in non-limiting terms. The only difference between, for example, bovine testing and human testing, are the sera to be tested and the second antibody to be used in the ELISA (rabbit anti-cow Ig in the case of the bovine test and rabbit anti-human Ig in the case of the human test). These materials are available commercially and are exceedingly well known to those of ordinary skill in the art.

Regarding the applicability of the bovine data contained in the specification to testing in other mammals, Applicant makes the following points:

1) Applicant is not required to submit any working examples to satisfy the enablement requirement. See *In re Robbins*, 166 USPQ 552 (CCPA 1970).

2) Applicant is not required to submit human testing to satisfy the enablement or utility requirements. See, for example, the Guidelines for Examination of Applications for Compliance with the Utility Requirement (first promulgated on 1/31/1995 (1170 O.G. 482): "Data generated using... testing in animals almost invariably will be sufficient to support an asserted therapeutic... utility."

3) The Prusiner prior art document supplied by the Office clearly indicates that spongiform encephalopathy in bovines (*i.e.*, BSE) is transmissible to other mammals, including non-human primates. This document also clearly shows the extremely close relationship between BSE and other forms of spongiform encephalopathy, such as kuru, Creutzfeldt-Jacob disease (CJD), and Gerstmann-Sträussler-Scheinker disease (GSS). Specifically, see page 667 of the Prusiner paper:

> Brain extracts from BSE cattle have transmitted disease to mice, cattle, sheep, and pigs.... Of particular importance in the BSE epidemic is the recent transmission of BSE to a nonhuman primate, the marmoset....

Regarding the very close relationship of BSE to other spongiform encephalopathies, see the opening comments of the Prusiner paper, at page 656:

> A set of remarkable discoveries in the past three decades has led to the molecular and genetic characterization of the transmissible pathogen causing scrapie in animals and a quartet of illnesses in human: kuru, CJD, GSS, and FFI (fatal familial insomnia).

The article goes on to discuss the concept of prions as a unique type or class of proteins. The article also concludes that prions are the causative agent or at least a contributing factor in all of the spongiform encephalopathies discussed in the article (scrapie, BSE, kuru, CJD, GSS, and FFI).

Therefore, because, BSE is transmissible to other species (as shown by the Prusiner article), it is extremely reasonable to conclude that a test that diagnoses spongiform encephalopathy in bovines will also reveal spongiform encephalopathy in other mammals too.

Regarding Claims 40-51, drawn to the diagnosis of multiple sclerosis in humans, Applicant directs the Examiner's attention to the Rule 132 Declaration of inventor Alan Ebringer, submitted herewith. In his declaration, Dr. Ebringer very clearly demonstrates,

using objective scientific evidence, that sera from humans suffering from multiple sclerosis contain elevated levels of antibodies specific to *Acinetobacter* spp. Insofar as the specification as filed clearly indicates that the method described therein is applicable to the diagnosis of multiple sclerosis (page 6, final paragraph), Dr. Ebringer's declaration provides overwhelmingly convincing evidence that the invention functions exactly as described in the specification.

In particular, note that Dr. Ebringer's declaration describes fabricating ELISAs to detect antibodies specific to five (5) different species or strains of bacteria of the genus Acinetobacter. See paragraph 8 of Dr. Ebringer's declaration. In comparing 26 patients confirmed to have MS, all 26 patients exhibited significantly increased levels of anti-Acinetobacter antibodies as compared to normal controls. This included increased levels of IgA, IgG and IgM anti-Acinetobacter antibodies.

Note that the ELISA described in Dr. Ebringer's declaration is identical to that described in the present application at page 5. Note also that the ELISAs described in Dr. Ebringer's declaration were read in blind format, with the experimenter gathering the results not knowing whether the samples being measured were test samples or control samples. Note lastly that the experiments presented in Dr. Ebringer's declaration were also deemed suitable for publication, and have, in fact, appeared in a peer-reviewed journal article (which has been made part of Dr. Ebringer's declaration).

The data presented in Dr. Ebringer's declaration clearly indicate that the subject invention, as described in the specification as filed, functions to indicate the presence of MS in a human test subject.

Applicant therefore respectfully submits that this rejection is untenable. Withdrawal of the rejection is now respectfully requested.

Rejection of Claims 1 and 9 Under 35 USC §112, Second Paragraph:

This rejection has been rendered moot by cancellation of the claims. None of Claims 13-43 include the phrase "at least about" or any passage referring to mimicry.

Withdrawal of this rejection is respectfully requested.

Rejection of Claims 1 and 2 Under 35 USC § 102(b) Over Toh et al.:

This rejection has been rendered moot by cancellation of the claims.

As applied to any of the now-pending claims, this rejection is respectfully traversed.

The Toh et al. paper discloses the reaction of sera of patients with various neurologic diseases with sub-unit proteins of neurofilaments. These proteins have molecular weights of 150 and 200 kDa. The paper does mention the sequence Phe-Ser-Trp- Gly-Ala-Glu-Gly-Gln-Lys.

That being said, the Toh et al. paper is also totally silent on the implications, if any, for a diagnostic assay for any of the diseases specifically mentioned. In particular, there is nothing in this paper that connects demyelinating diseases such as MS or spongiform encephalopathy with antibodies specific to Acinetobacter, Agrobacter, or Ruminococcus antigens. Toh et al. do not even mention any of these microorganisms. Insofar as the invention is directed to a method that measures antibodies that are specific for these microorganisms, the Toh et al. paper is irrelevant to the present claims.

In short, Toh et al. make no correlation whatsoever between sequences found in neurofilament proteins and those found in Acinetobacter, Agrobacter, or Ruminococcus organisms. Thus, the central thrust of the present claims is completely absent from the Toh et al. paper.

Because Toh et al. fails entirely to describe each and every element of the invention as now claimed, a requirement under §102(b), this rejection is improper.

Nor are the present claims rendered obvious in view of the Toh et al. paper. As noted above, the Toh et al. document fails entirely even to mention a single microorganism of the genus Acinetobacter, Agrobacter, or Ruminococcus. Therefore, there is no motivation or suggestion within the Toh et al. document itself to arrive at the now-claimed invention.

Applicants therefore respectfully submit that none of Claims 13-55 are anticipated by or rendered obvious in view of the Toh et al. reference. Withdrawal of the same is respectfully requested.

Rejection of Claims 1-12 Under §103(a) Over Toh et al. in View of Eylar et al. and Prusiner:

As applied to Claims 1-12, this rejection has been rendered moot by cancellation of the claims.

Applicant respectfully submits that this rejection is not relevant to the claims newly submitted herein.

Specifically, the primary reference to Toh et al. fails entirely even to mention a single microorganism from the genus Acinetobacter, Agrobacter, or Ruminococcus. Likewise, the Eylar et al. reference also fails to mention a single microorganism from the genus Acinetobacter, Agrobacter, or Ruminococcus. The Prusiner et al. paper also fails to mention a single microorganism from the genus Acinetobacter, Agrobacter, or Ruminococcus. Thus, **the combination** of these three references cannot render obvious any of the present claims because the method claims require assaying a test subject for antibodies specific for a microorganism of the genus Acinetobacter, Agrobacter, or Ruminococcus. Because **the combined** references do not even mention any of these organisms, the combined references cannot and do not render obvious any of the now-pending claims.

Granted, the Eylar document does disclose the amino acid sequence RFSWGAEGQK, while in the present application SEQ. ID. NO: 1 is FSWGAEGQK. But, note that in the present application, SEQ. ID. NO: 1 was used as a probe to search certain databases to reveal the relationship between spongiform encephalopathy, MS, CJD, etc. and the Acinetobacter, Agrobacter, and Ruminococcus microorganisms. No such relationship is described, or even remotely suggested by **the combined** references. The Eylar reference is concerned entirely with certain aspects of Experimental Allergic Encephalomyelitis—it is silent regarding a method of diagnosing MS or spongiform encephalopathy.

Moreover, the Prusiner reference explicitly teaches away from any relationship between a microorganism or a virus and ailments such as BSE, CJD, and MS. Prusiner (a 1997 Nobel Prize winner in Medicine) is the founder and foremost proponent of the prion theory to explain the etiology and transmission of spongiform encephalopathies. The Prusiner reference holds that these types of diseases are caused by prions—highly stable

infectious proteins. The Prusiner reference neither teaches, nor makes any suggestion that BSE or MS is caused by any type of microorganism or even related to any type of microorganism. Thus, rather then suggesting the present invention, the combination of Prusiner with the Toh et al. and Eylar et al. teaches away from a method of diagnosing spongiform encephalopathies that looks for elevated levels of antibodies specifically reactive with a microorganism of any sort (much less a microorganism of the genus Acinetobacter, Agrobacter, and Ruminococcus.

Therefore, Applicant respectfully submits that none of the present claims are rendered obvious in view of the Toh et al., Eylar et al., and Prusiner references, taken alone or in any combination. Withdrawal of the rejection is respectfully requested.

CONCLUSION

Applicant submits that the application is now in condition for allowance. Early notification of such action is earnestly solicited.

Respectfully submitted,

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Certificate of Mailing: I hereby certify that this Response and the papers indicated as being transmitted herewith is being deposited with the United States Postal service on this date 2 April 02, in an envelope as "Express Mail Post Office to Addressee, Mailing Label No. EL868576172US, addressed to the Assistant Commissioner for Patents, Washington, DC 20231.

Marcia A. Layton 2 April 02
Marcia A. Layton date

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

SERIAL NO: 09/269,607 ART UNIT: 1645

FILING DATE: 07/26/1999 EXAMINER: Fields, I.

INVENTOR: Ebringer

TITLE: Diagnosis of Spongiform Disease

MARKED UP PARAGRAPHS, 37 CFR §1.121(b)(iii)

At page 1, please delete the entire paragraph at lines 14-22, and insert in its place the following paragraph:

-- A characteristic histopathological feature of BSE is a "spongiform" appearance, which also occurs in chronic but not acute "experimental allergic encephalomyelitis" (EAE), at least in rabbits and guinea pigs. A short sequence of bovine myelin (FSWGAEGQK) **(SEQ. ID. NO: 1)**, which withstands denaturation following heating to 100°C for one hour, was reported over twenty-five years ago to produce hind quarters paralysis, tremors and death, following inoculation into guinea pigs, which to some extent resembles the features observed in cattle suffering from BSE. In accordance with the present invention, this sequence has been used as a computer probe to search for proteins showing molecular mimicry. This sequence, in denatured form, may be described as encephalitogenic. --

At page 2, please delete the entire table at lines 5-12, and insert in its place the following table:

-- Comparison of Amino Acids of Bovine Myelin to Microorganisms from GenBank and SwissProt Which Have Similar Sequences in Other Proteins.

Source	Amino Acids	Positions	Locations
Bovine myelin	LSRFSWGAE **(SEQ. ID. NO: 2)**	110-118	
Acinetobacter calcoaceticus	ISRFAWGEV **(SEQ. ID. NO: 3)**	41-49	4-carboxy-mucolactone decarboxylase
Agrobacter tumefaciens	YTRFTWGAP **(SEQ. ID. NO: 4)**	693-701	β-glucosidase
Ruminococcus albus	YTQFEISAE **(SEQ. ID. NO: 5)**	274-282	β-glucosidase

Alphabetic letters refer to biochemical symbols for amino acids. --

Please delete the entire paragraph spanning page 2, line 15, to page 3, line 2, and insert in its place the following paragraph:

-- The present invention therefore provides a diagnostic test for spongiform encephalopathy and other demyelinating conditions in mammals which comprises assaying antibodies present in the mammal which bind to an antigenic peptide which exhibits molecular mimicry of a mammalian myelin peptide, especially one having the sequence FSWGAEGQK **(SEQ. ID. NO: 1)**. The term "molecular mimicry" refers to a degree of similarity (sequence homology) as between the antigenic peptide and a myelin peptide which results in the formation of antibodies which cross-react with myelin and demyelinate nervous tissue. The presence of such antibodies at elevated levels compared to those found in unaffected animals is therefore a marker for BSE which may be used to detect BSE at an early stage at which curative or other appropriate action may be taken. --

At page 3, after the third full paragraph (*i.e.*, after line 12), please insert the follow paragraphs:

-- BRIEF DESCRIPTION OF THE DRAWING FIGURE

The sole drawing figure is a graph depicting Acinetobacter calcoaceticus antibody titres for four groups of animals: three control groups known not to have BSE and one group known to have BSE. --

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

SERIAL NO: 09/269,607 ART UNIT: 1645

FILING DATE: 07/26/1999 EXAMINER: Fields, I.

INVENTOR: Ebringer

TITLE: Diagnosis of Spongiform Disease

CLEAN VERSION OF ENTIRE SET OF PENDING CLAIMS
37 CFR §1.121(c)(3)

13. **[NEW]** A method of diagnosing spongiform encephalopathy and multiple sclerosis in a mammalian subject, including a human subject, the method comprising measuring a bodily fluid of the subject for antibodies capable of binding to a microorganism classified within a genus selected from the group consisting of Acinetobacter, Agrobacter, and Ruminococcus, and wherein the microorganism contains an antigenic peptide that has sufficient sequence homology with a mammalian myelin peptide such that the antibodies capable of binding to the microorganism are cross-reactive with mammalian myelin and demyelinate nervous tissue, wherein an elevated level of the antibodies in the subject as compared to a corresponding level of the antibodies in known unaffected subjects indicates spongiform encephalopathy or multiple sclerosis in the subject.

14. **[NEW]** The method of Claim 13, wherein the mammalian subject is a human, and the method is to diagnose multiple sclerosis.

15. **[NEW]** The method of Claim 13, wherein the mammalian subject is a bovine, and the method is to diagnose bovine spongiform encephalopathy.

16. **[NEW]** The method of Claim 13, wherein the bodily fluid measured is serum.

17. **[NEW]** The method of Claim 13, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism classified within the genus Acinetobacter.

18. **[NEW]** The method of Claim 13, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism classified within the genus Agrobacter.

19. **[NEW]** The method of Claim 13, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism classified within the genus Ruminococcus.

20. **[NEW]** The method of Claim 13, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism selected from the group consisting of *Acinetobacter calcoaceticus*, *Agrobacter tumefaciens*, and *Ruminococcus albus*.

21. **[NEW]** The method of Claim 13, wherein the antibodies are measured using an enzyme-linked immunosorbent assay.

22. **[NEW]** The method of Claim 21, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole bacteria classified within a genus selected from the group consisting of Acinetobacter, Agrobacter, and Ruminococcus.

23. **[NEW]** The method of Claim 21, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole bacteria selected from the group consisting of *Acinetobacter calcoaceticus*, *Agrobacter tumefaciens*, and *Ruminococcus albus*.

24. **[NEW]** The method of Claim 21, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole *Acinetobacter calcoaceticus* bacteria.

25. **[NEW]** The method of Claim 21, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole bacteria wherein the bacteria contains an antigenic peptide comprising an amino acid sequence as shown in SEQ. ID. NOS: 1, 3, 4, and 5.

26. **[NEW]** The method of Claim 13, wherein the antibodies are measured using an enzyme-linked immunosorbent assay that utilizes as a test antigen a polypeptide selected from the group consisting of SEQ. ID. NOS: 1, 3, 4, and 5.

27. **[NEW]** The method of Claim 13, wherein the microorganism contains an antigenic peptide comprising an amino acid sequence as shown in SEQ. ID. NOS: 1, 3, 4, and 5.

28. **[NEW]** A method of diagnosing spongiform encephalopathy in a bovine subject, the method comprising measuring serum collected from a bovine subject for antibodies capable of binding to a microorganism classified within a genus selected from the group consisting of Acinetobacter, Agrobacter, and Ruminococcus, and wherein the microorganism contains an antigenic peptide that has sufficient sequence homology with a mammalian myelin peptide such that the antibodies capable of binding to the microorganism are cross-reactive with mammalian myelin and demyelinate nervous tissue, wherein an elevated level of the antibodies in the subject as compared to a corresponding level of the antibodies in known unaffected subjects indicates spongiform encephalopathy in the subject.

29. **[NEW]** The method of Claim 28, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism classified within the genus Acinetobacter.

30. **[NEW]** The method of Claim 28, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism classified within the genus Agrobacter.

31. **[NEW]** The method of Claim 28, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism classified within the genus Ruminococcus.

32. **[NEW]** The method of Claim 28, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism selected from the group consisting of *Acinetobacter calcoaceticus*, *Agrobacter tumefaciens*, and *Ruminococcus albus*.

33. **[NEW]** The method of Claim 28, wherein the antibodies are measured using an enzyme-linked immunosorbent assay.

34. **[NEW]** The method of Claim 33, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole bacteria classified within a genus selected from the group consisting of Acinetobacter, Agrobacter, and Ruminococcus.

35. **[NEW]** The method of Claim 33, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole bacteria selected from the group consisting of *Acinetobacter calcoaceticus*, *Agrobacter tumefaciens*, and *Ruminococcus albus*.

36. **[NEW]** The method of Claim 33, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole *Acinetobacter calcoaceticus* bacteria.

37. **[NEW]** The method of Claim 33, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole bacteria wherein the bacteria contains an antigenic peptide comprising an amino acid sequence as shown in SEQ. ID. NOS: 1, 3, 4, and 5.

38. **[NEW]** The method of Claim 28, wherein the antibodies are measured using an enzyme-linked immunosorbent assay that utilizes as a test antigen a polypeptide selected from the group consisting of SEQ. ID. NOS: 1, 3, 4, and 5.

39. **[NEW]** The method of Claim 28, wherein the microorganism contains an antigenic peptide comprising an amino acid sequence as shown in SEQ. ID. NOS: 1, 3, 4, and 5.

40. **[NEW]** A method of diagnosing multiple sclerosis in a human subject, the method comprising measuring serum collected from a human subject for antibodies capable of binding to a microorganism classified within a genus selected from the group consisting of Acinetobacter, Agrobacter, and Ruminococcus, and wherein the microorganism contains an antigenic peptide that has sufficient sequence homology with a mammalian myelin peptide such that the antibodies capable of binding to the microorganism are cross-reactive with mammalian myelin and demyelinate nervous tissue, wherein an elevated level of the antibodies in the subject as compared to a corresponding level of the antibodies in known unaffected subjects indicates multiple sclerosis in the subject.

41. **[NEW]** The method of Claim 40, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism classified within the genus Acinetobacter.

42. **[NEW]** The method of Claim 40, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism classified within the genus Agrobacter.

43. **[NEW]** The method of Claim 40, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism classified within the genus Ruminococcus.

44. **[NEW]** The method of Claim 40, wherein the bodily fluid is measured for the presence of antibodies capable of binding to a microorganism selected from the group consisting of *Acinetobacter calcoaceticus*, *Agrobacter tumefaciens*, and *Ruminococcus albus*.

45. **[NEW]** The method of Claim 40, wherein the antibodies are measured using an enzyme-linked immunosorbent assay.

46. **[NEW]** The method of Claim 45, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole bacteria classified within a genus selected from the group consisting of Acinetobacter, Agrobacter, and Ruminococcus.

47. **[NEW]** The method of Claim 45, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole bacteria selected from the group consisting of *Acinetobacter calcoaceticus*, *Agrobacter tumefaciens*, and *Ruminococcus albus*.

48. **[NEW]** The method of Claim 45, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole *Acinetobacter calcoaceticus* bacteria.

49. **[NEW]** The method of Claim 45, wherein the enzyme-linked immunosorbent assay utilizes as a test antigen whole bacteria wherein the bacteria contains an antigenic peptide comprising an amino acid sequence as shown in SEQ. ID. NOS: 1, 3, 4, and 5.

50. **[NEW]** The method of Claim 40, wherein the antibodies are measured using an enzyme-linked immunosorbent assay that utilizes as a test antigen a polypeptide selected from the group consisting of SEQ. ID. NOS: 1, 3, 4, and 5.

51. **[NEW]** The method of Claim 40, wherein the microorganism contains an antigenic peptide comprising an amino acid sequence as shown in SEQ. ID. NOS: 1, 3, 4, and 5.

52. **[NEW]** A kit for diagnosing spongiform encephalopathy and multiple sclerosis in a mammalian subject, including a human subject, the kit comprising, in combination:

a first vessel containing a microorganism classified within a genus selected from the group consisting of Acinetobacter, Agrobacter, and Ruminococcus; and

instructions for use of the kit.

53. **[NEW]** The kit of Claim 52, wherein the first vessel is suitable for conducting enzyme-linked immnuosorbent assays therein and the microorganism is adhered to an inside surface of the vessel such that the microorganism is capable of reacting with antibodies in a solution added to the vessel.

54. **[NEW]** The kit of Claim 52, wherein the microorganism is selected from the group consisting of *Acinetobacter calcoaceticus*, *Agrobacter tumefaciens*, and *Ruminococcus albus*.

55. **[NEW]** The kit of Claim 52, wherein the microorganism contains an antigenic peptide comprising an amino acid sequence as shown in SEQ. ID. NOS: 1, 3, 4, and 5.